

July 16, 1969

Approved For Release 2006/09/25 : CIA-RDP72B00464R000600010005-4

DESIGN PLAN

TRANSPORTABLE COMMUNICATIONS TERMINALS

16 JULY 1969

WORK ORDER - 4 CONTRACT

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PRELIMINARY

Approved For Release 2006/09/25 : CIA-RDP72B00464R000600010005-4

The purpose of this document is to describe the effort to be performed in accordance with Work Order No. -4, [REDACTED]

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STAT The technical description of the communication systems to be delivered was provided by [REDACTED] proposal entitled "Three Transportable Communications Terminals dated 12 June, 1969," and meeting minutes dated 6 June 1969.

This document provides a technical specification defining two separate transportable communication systems. One system consists of remotely controlled hf/uhf air-to-ground communication equipment. The second system consists of a full duplex hf point-to-point, cw, and fsk tty radio terminal. The system design will include components supplied by the contractor as well as those supplied by the customer. These are defined in later sections.

The communication terminals, including the auxiliary equipment case, are to be easily transported for rapid global deployment.

2. SYSTEM OPERATIONAL REQUIREMENTS

2.1 GENERAL REQUIREMENTS

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Work Order no. 4, [] establishes the requirement [] to design, fabricate and test functional groupings of equipments identified as the air-to-ground (A/G) terminal and the point-to-point P/P terminal.

The A/G terminal provides a means to accomplish air-to-ground voice communication by hf and uhf transmission. Two identical terminals are provided.

The P/P terminal provides a means to accomplish point-to-point cw and fsk communications by hf transmission. One terminal is provided.

2.1.1 OPERATIONAL CRITERIA

The major mission of the air-to-ground and point-to-point terminals will be to provide the designated communications. To support this mission, a high degree of transportability as well as design considerations for the reoccurring deployment, setup, operation and storage requirements of the packages will be included.

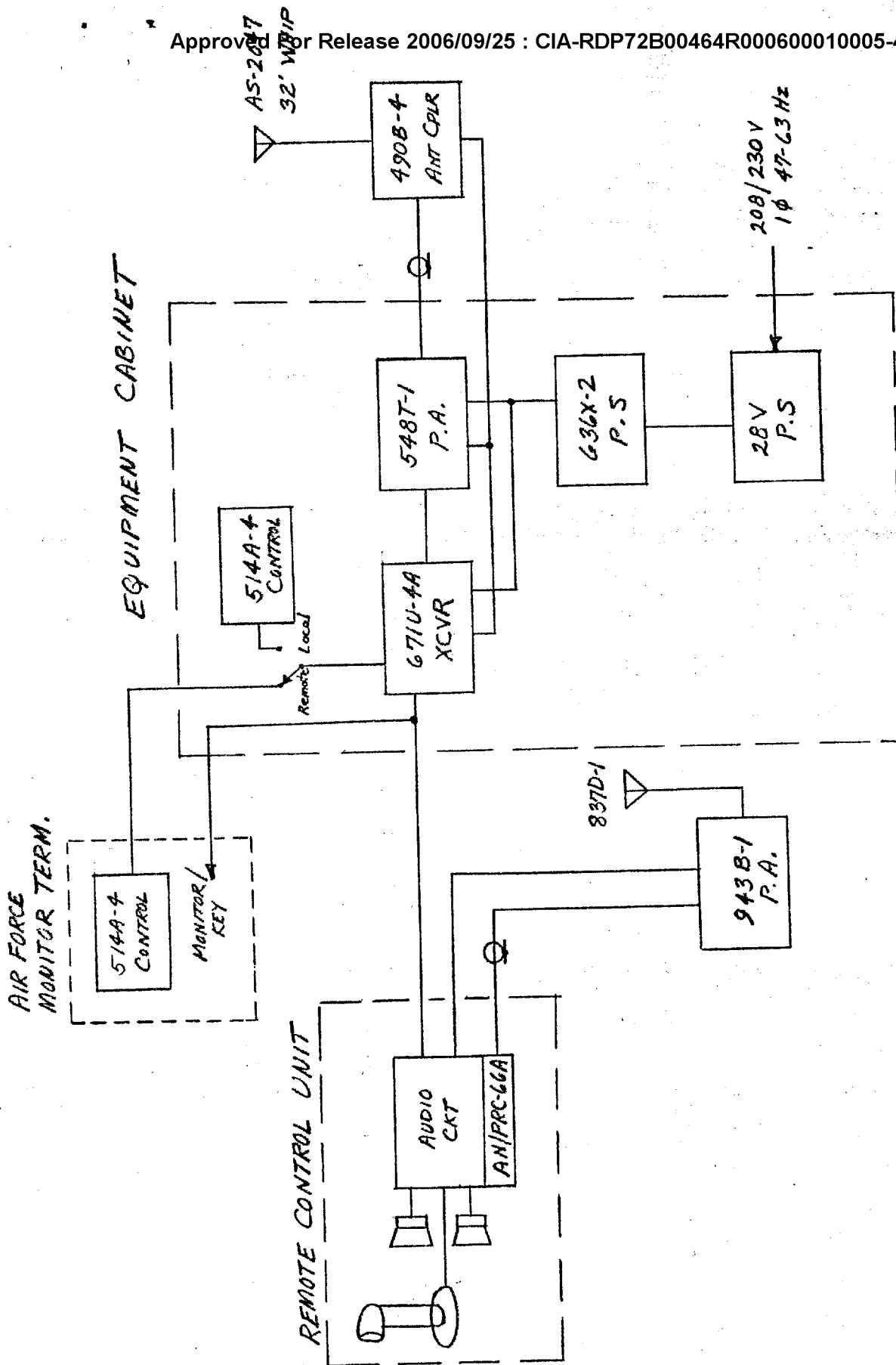
2.1.2 AIR-TO-GROUND TERMINAL

- a. The A/G terminal provides air-to-ground voice communications in the 2.0000 to 29.9999 MHz and in the 225.00 to 399.95 MHz frequency regions. The terminal consists of a 400 watt, pep./average hf transceiver and a 2 watt uhf transceiver augmented with a 10 watt power amplifier. Major equipment items are contained in a transportable equipment cabinet with an auxiliary case to

- b. The terminal has the following capabilities:
- (i) One transceive voice channel in the 2.000 to 29.9999 MHz high frequency region or,
 - (ii) One transceive voice channel in the 225.00 to 399.95 MHz ultrahigh frequency region or,
 - (iii) Simultaneous modulation on both channels.
 - (iv) Digital data rates on the hf channel up to 2400 bits per second with appropriate modem
- c. A simplified block diagram of the functional system is shown in figure 2-1. Normal operation of the terminal is from the remote control unit (RCU).

The audio circuits for the hf radio are remoted to the operating position. The frequency and mode controls are remotely controlled from a 514A-4 control unit in the equipment terminal or a remote 514A-4 control unit at the external monitoring position (not part of this system). Radio status will be furnished on the audio lines to both the remote operating position and the external monitoring position. The hf antenna coupler is an automatically tuned device capable of complete remote operation.

The transceiver portion of the AN/PRC-66A uhf radio will be contained in the RCU. Full control of the uhf circuit will thus be maintained by the operator at the remote operation position. The uhf rf signals from the PRC-66A transceiver are routed to a remotely located power amplifier to provide full radiated power from the antenna.

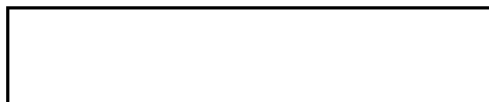


AIR-TO-GROUND
BLOCK DIAGRAM
FIGURE 2-1

26 August 1969

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To:



Washington, D. C. 20024

Subject: Final Design Plan, Transportable Communications Terminals,
dated 19 August 1969. Contract Work Order 4

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Enclosures: (A) Design Plan, Transportable Communications Terminal,
dated 19 August 1969 (3 copies)

(B) Installation Drawing, HF Control 514A-4,
dated 25 August 1969 (1 copy)

Dear Sir,

The enclosed Design Plan, dated 19 August 1969, represents the agreed upon configuration of the Communications Terminals and includes the comments made during your review of the Preliminary Design Plan. In addition the Design Plan also includes a revised Interface Connector Information listing which changes the Connectors for the Tie Line Cable and Receptacle.

For Your information a copy of the 514A-4 Installation Drawing has been enclosed. A copy of the drawing has been forwarded, under separate cover, to the System "B" Contractor this date.

If changes in the Design Plan are necessary as a result of your review, it is requested this office be advised no later than 10 Sept. 1969 as effort on the Terminals is proceeding in accordance with the submitted Design Plan.

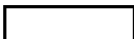
Sincerely,



Director, Special Projects

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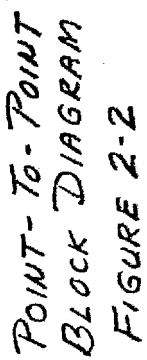
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2.1.3 POINT-TO-POINT TERMINAL

- a. The P/P Terminal provides point-to-point communications by cw and fsk (RTTY) in the 2.0000 to 29.9999 MHz high frequency region. The terminal is a 400 watt pep/average hf transceiver housed in containers similar to the A/G configuration.
- b. The terminal has the following capabilities:
 - (i) One full-duplex cw channel in the 2.0000 to 29.9999 MHz high frequency region or,
 - (ii) One full-duplex RTTY channel in the 2.0000 to 29.9999 MHz frequency region.
- c. A simplified block diagram of the functional system is shown in figure 2-2.

Control of the radio equipment is maintained from the front panel of the equipment cabinet. With the use of manual patches, a cw circuit is initially established in a full-duplex configuration. The patch cords are then removed, reconfiguring the system for radio teletypewriter operation. External GFE teletypewriter equipment must be connected to the system before normal operation can take place.



3.1 SYSTEM DESCRIPTION

This section presents a description of the air-to-ground and point-to-point communication terminals.

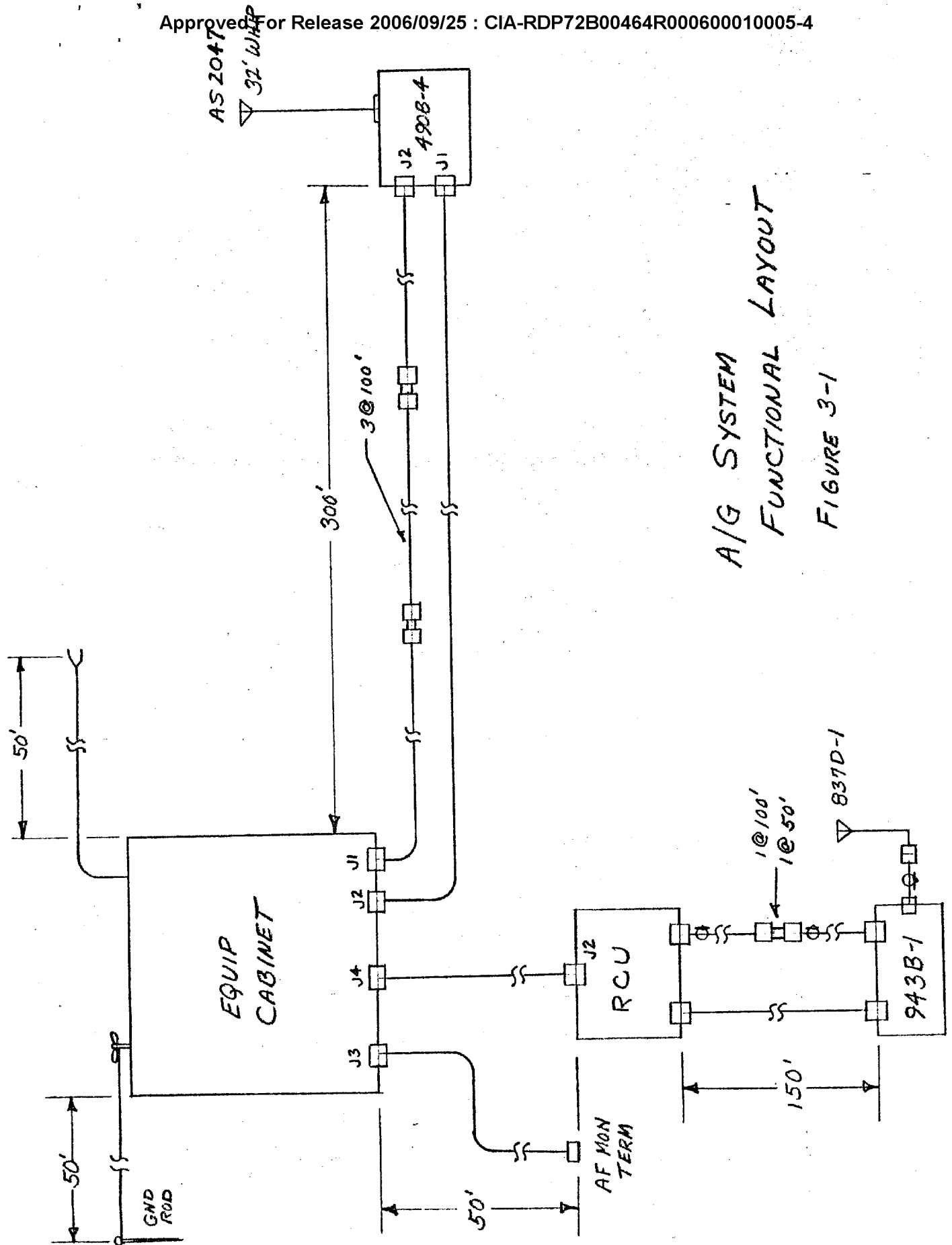
3.1.1 AIR-TO-GROUND TERMINAL

The block diagram of the A/G terminal is shown in figure 2-1. A functional system layout is shown in figure 3-1. Control cables interconnect the equipment cabinet with the remote control unit, the hf antenna coupler and external AF monitoring unit. In addition the RCU is connected to a remoted 943B-1 uhf power amplifier.

The RCU extends the audio/keyline of the hf radio circuit up to a distance of 50 feet from the equipment cabinet. Transmit audio signals originate at the RCU and are routed to the equipment cabinet. From the equipment cabinet the lines are routed to the AF monitor terminal for Selcal conditioning. This permits signals to originate at the external monitoring unit as well as at the RCU. The hf receive audio is routed directly from the radio shelf in the equipment cabinet to a loudspeaker at the RCU and the external monitor terminal.

Space is provided in the RCU to insert the transceiver portion of the AN/PRC-66A. The transmit audio signals for the uhf circuit originate in the RCU and connect directly to the input of the AN/PRC-66A. The audio output of the AN/PRC-66A connects directly to a loudspeaker at the RCU,

The transmit and receive audio lines of each radio circuit are paralleled and routed to the external AF monitoring unit. Bridging impedance is not provided as part of the A/G terminal, this must be included with the external monitoring terminal.



A/G SYSTEM
FUNCTIONAL LAYOUT
FIGURE 3-1

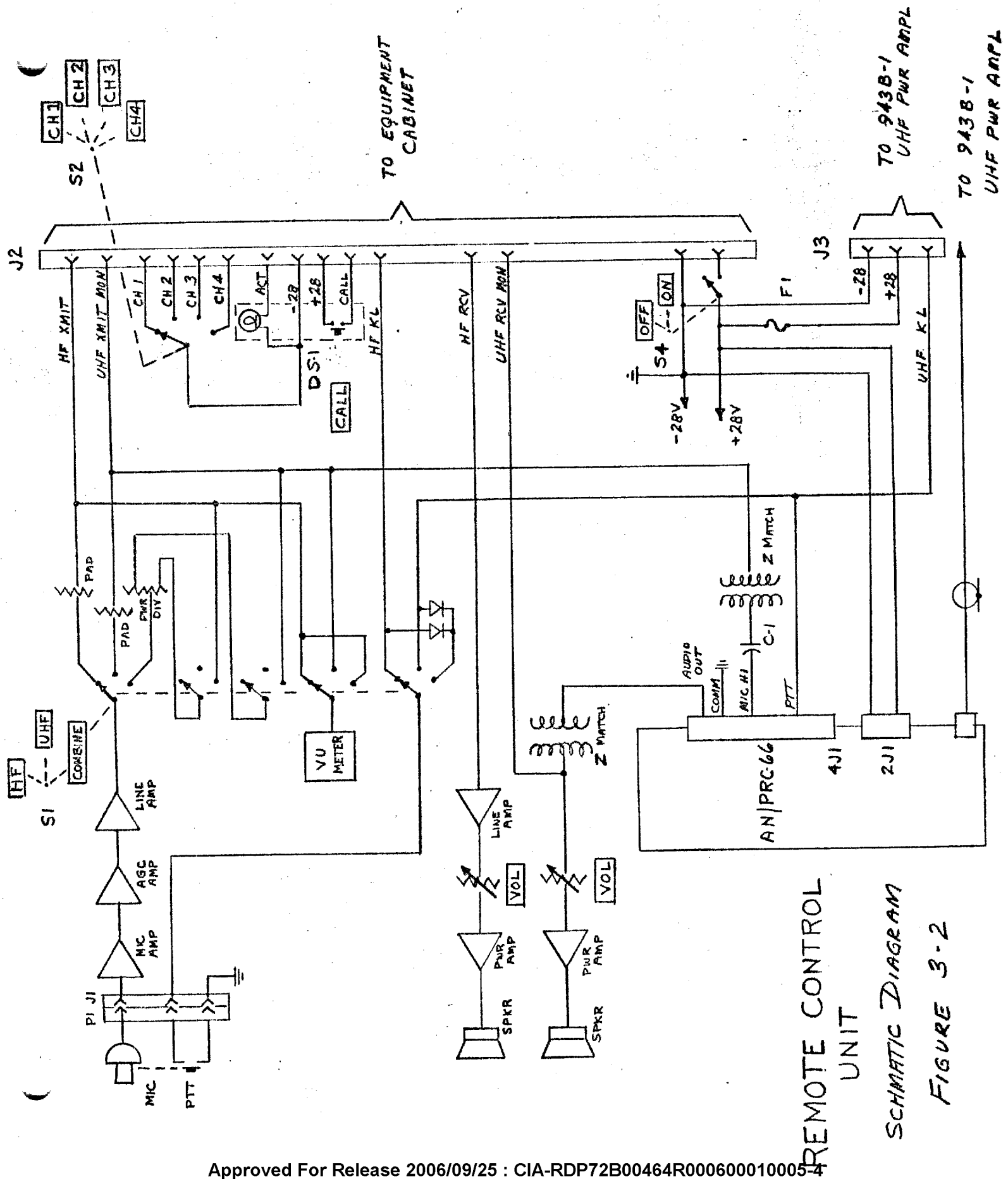
A schematic diagram of the RCU is shown in figure 3-2.

The circuitry is designed to allow voice modulation on either radio or on both simultaneously. A volume unit (VU) meter is provided for circuit monitoring by the operator.

Remote controls for an external selective calling system are also provided in the RCU. The circuitry consists of a four-position channel select switch, a pushbutton initiate switch and an indicator lamp. The control lines for this circuit are routed through the equipment cabinet to the AF Monitor Terminal. A front panel layout of the RCU is shown in figure 3-3.

The AF monitor Terminal will contain a 514A-4 unit for remote control of the hf transceiver. The remote 514A-4 control will maintain normal operating control of the radio. A remote/local switch allows the 514A-4 control unit located on the connector panel in the equipment cabinet to assume control for maintenance or emergency operation.

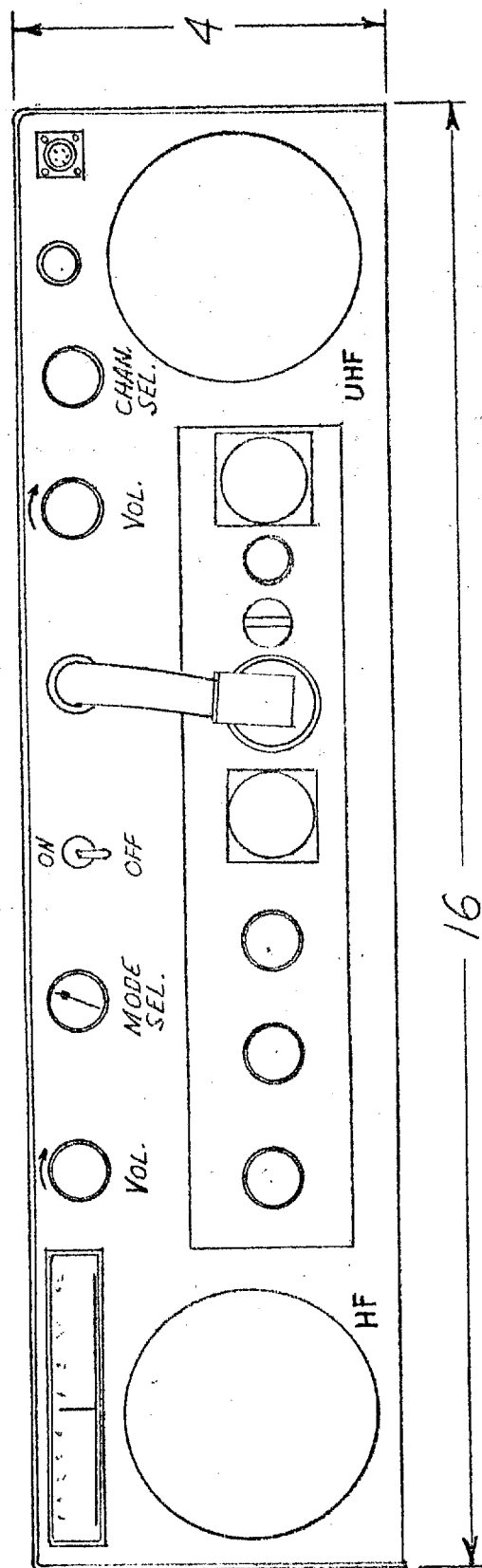
The rf output from the hf power amplifier is routed to the input of the 490B-4 antenna coupler. The 490B-4 is an automatically tuned hf coupler designed to tune wire and whip antennas in the frequency range of 2 to 30 MHz. The coaxial feed between the equipment cabinet and the 490B-4 antenna coupler will consist of three, 100 foot sections of Andrew FSJ4 Superflex coaxial cable. Any amount of cable up to the maximum of 300 feet can be used depending on the proximity equipment cabinet and the antenna couplers.



REMOTE CONTROL
UNIT

SCHEMATIC DIAGRAM

FIGURE 3-2



RADIO CONTROL UNIT.

FRONT VIEW

FIGURE 3-3

The rf output from the AN/PRC-66A is used to drive a 10 watt power amplifier located up to a distance of 150 feet from the RCU. The 943B-1 power amplifier requires a minimum input of 0.5 watts to produce the 10 watt rated output. Coaxial cable attenuation at the high end of the frequency range limits the distance the power amplifier can be remoted from the RCU to the 150 foot maximum. The coaxial feed will be supplied in one, 100 foot section and one, 50 foot section. The amount of cable used will depend upon the physical limitations of the site.

3.1.2 POINT-TO-POINT TERMINAL

Refer to the block diagram of the P/P terminal shown in figure 2-2.

A function system layout is shown in figure 3-4.

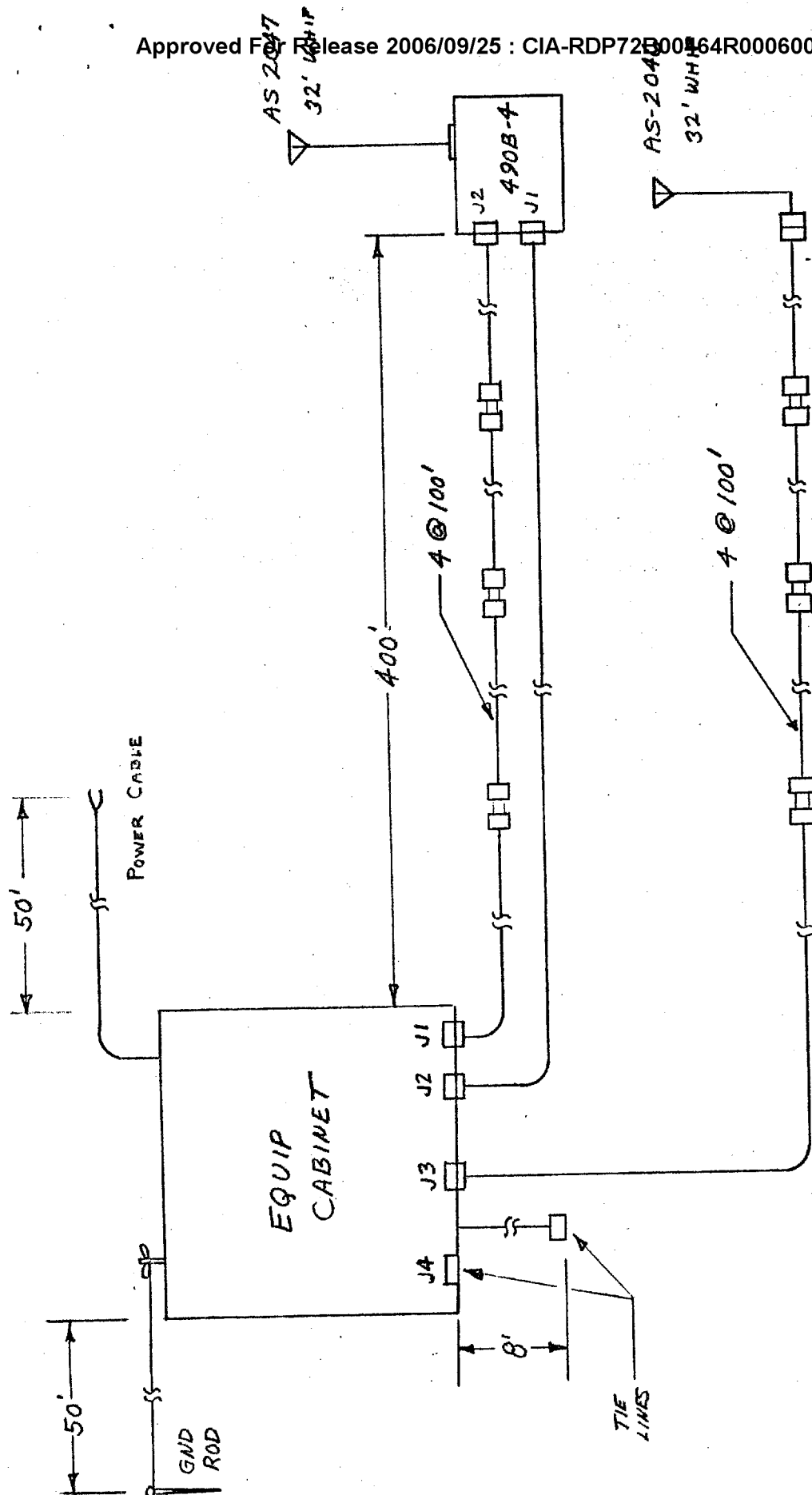
In the normal operating full-duplex configuration, only the transmit portion of the 718U-4 transceiver will be utilized. The GFE RA-2167 hf receiver will serve as the receive portion of the circuit.

The GFE fsk modems will be installed and connected as indicated on the diagrams. The dc input/outputs of the fsk modems will be brought to a terminal strip on the connector panel of the equipment cabinet. External teletypewriter equipment with associated loop power supplies are to be wired to this terminal board. The teletypewriter equipment is not provided as part of the P/P terminal.

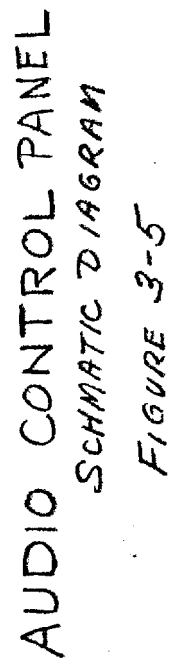
The tie lines consist of two, 6 pair circuits. These appear as six (6) jacks on the patch field. Three of the jacks are wired to a quick-disconnect receptacle on the connector panel. The other three are wired to an eight (8) foot cable with a quick-disconnect plug on the end.

The audio circuitry and radio control is contained on the audio control panel in the equipment cabinet. A schematic diagram of the panel is shown in figure 3-5. The 514A-4 control unit is mounted on the panel to provide frequency and mode control for the hf transceiver. A status indicator lamp on the 514A-4 provides operator supervision. This is in addition to aural supervision that is available on the receive audio lines. Dual speakers with independent volume controls are provided on the panel with jackfield entrances for patching purposes.

Dual 1000 Hz oscillators are switch selectable from the panel to provide a patchable input to the radio circuit.



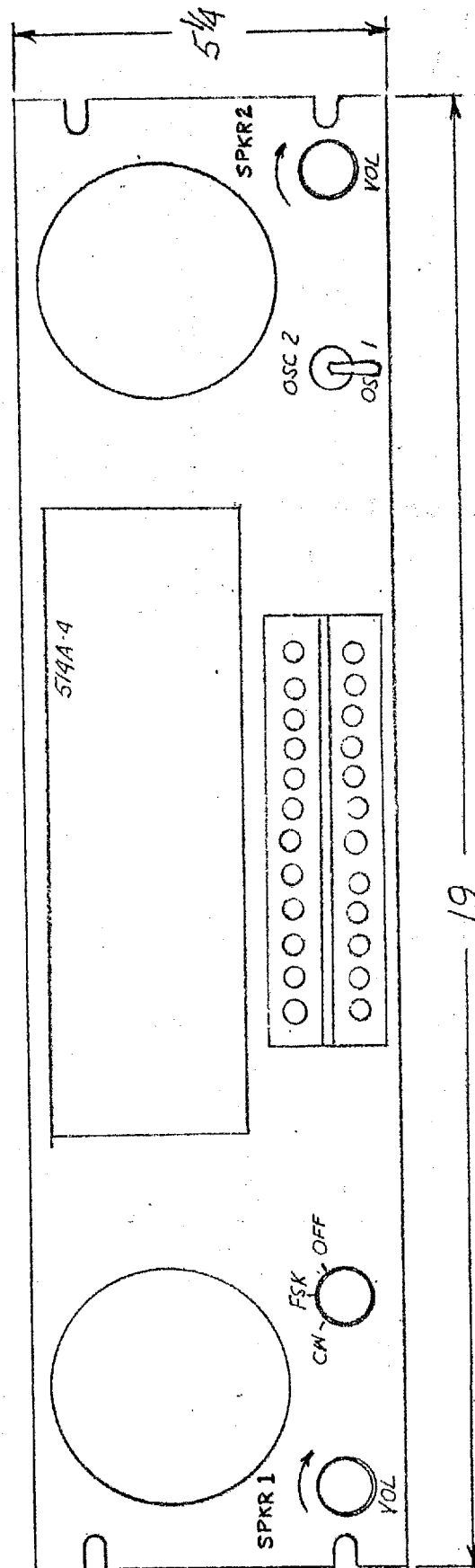
P/P SYSTEM
FUNCTIONAL LAYOUT
FIGURE 3-4



The audio input/outputs from the GFE fsk modems are brought to the patch-field. One circuit is normalled-through to the hf equipment, the backup circuit is available on a patched basis.

The jackfield contains twenty-four (24) of the ADC Bantom type PJ838 jacks. Seven of the circuits (14 jacks) are normalled-through, the remaining jacks are wired as separate circuits. Patch cords will be provided to satisfy patching requirements.

A front view of the audio control panel is shown in figure 3-6.



AUDIO CONTROL PANEL
FRONT VIEW
FIGURE 3-6

3.1.3 ELECTRICAL INPUT POWER

3.1.3.1 A/G Terminal - All equipments within the A/G terminal operate from voltages derived from the 28 volt DC power supply. The input to the 28 volt DC power supply requires a single-phase, nominal 208/230 volt AC, 47-63 Hz source. Circuit breakers will be provided on the connector panel of the equipment cabinet for the 28 volt distribution system. In addition, an on-off switch will be furnished at the RCU with a fused 28 volt power DC power circuit for the remoted uhf power amplifier.

The 50 foot 3-wire power cable shall connect directly to the dc power supply. The cable shall be permanently affixed at the cabinet. The free end of the cable shall be provided with a pigtail termination. Storage space for the cable shall be provided in the cabinet if possible.

3.1.3.2 P/P Terminal - The P/P terminal shall operate from a single-phase primary power source nominal 208/230 volt, AC 47-63 Hz. A step-down transformer shall be provided to supply power to the GFE equipments which require a 120 volt AC single-phase source.

The 50 foot 3-wire power cable shall be permanently affixed to a terminal block within the cabinet. Distribution and circuit protection from the terminal block shall be provided. The free end of the cable shall be provided with a pigtail termination. Storage space for the cable shall be provided in the cabinet if possible. Circuit breakers will be provided on the connector panel of the equipment cabinet for the 28 volt DC distribution system.

3.1.4 GROUNDING

A threaded stud with washers and a wing nut shall be provided on the equipment cabinet frame for attaching a ground cable. The electrical system and all metal surfaces of the cabinet shall be grounded through this stud. A suitable ground rod and 50 feet of cable shall be provided.

3.2 PHYSICAL DESCRIPTION

3.2.1 EQUIPMENT CABINET

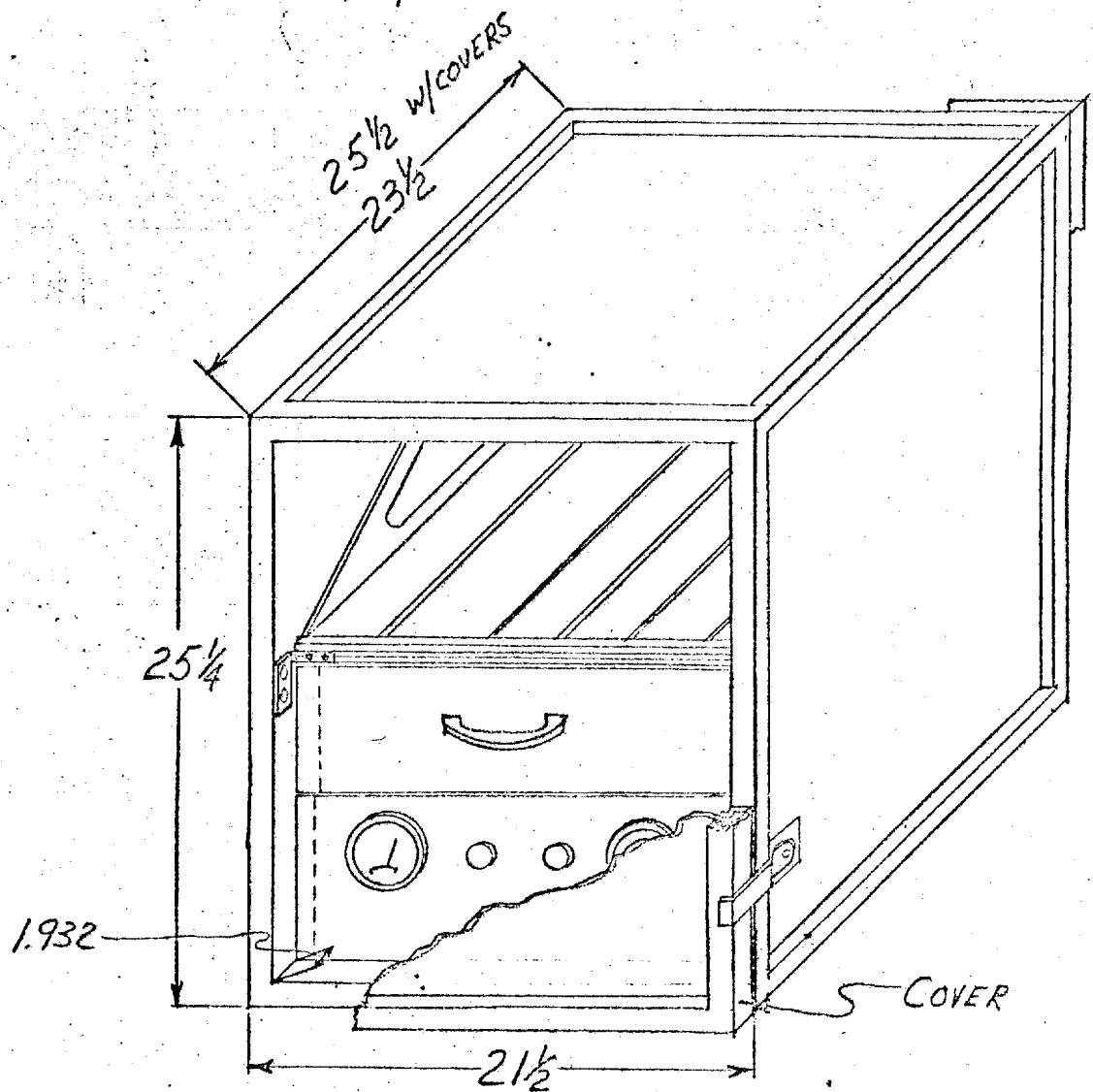
The equipment will be housed in a rugged, lightweight transit case. The transit case will consist of an extruded aluminum frame with aluminum side panels bonded to the frame. Front and rear cover will be easily removable and will provide a weather tight seal. Standard EIA mounting rails will be secured to the case where needed. All handles and latches will be recessed to give an unobstructed exterior.

Refer to figure 3-7 for appropriate dimensions of the A/G cabinet. This view also shows the equipment rack-up within the cabinet. Figure 3-8 is a side and rear view of the cabinet showing the connector panel mounted to the rear rails. The connector panel contains all exterior receptacles circuit breakers and the 514A-4 control unit.

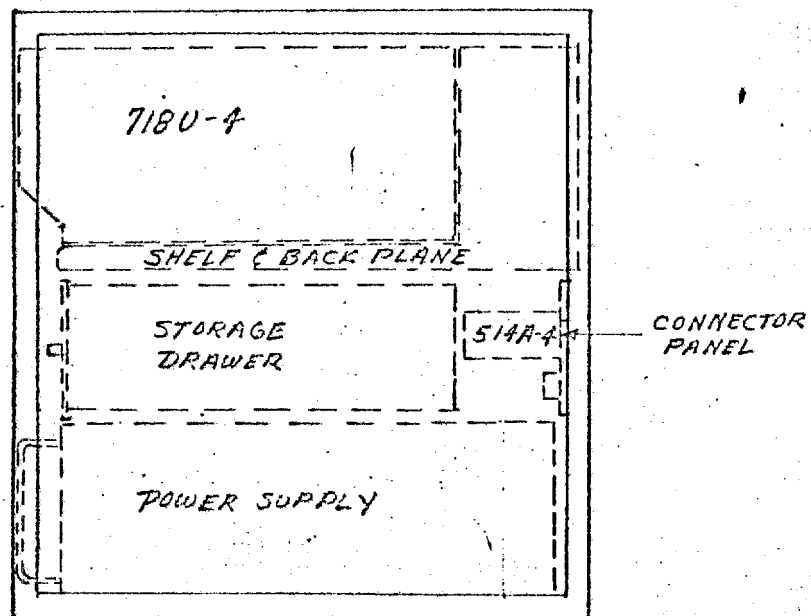
Refer to figure 3-9 for approximate dimensions and rack-up of the P/P cabinet. Figures 3-10 and 3-11 show the right and rear view of the cabinet. The connector panel contains all exterior receptacles, circuit breakers and the step-down transformer for the primary power.

3.2.2 AUXILIARY EQUIPMENT CASE

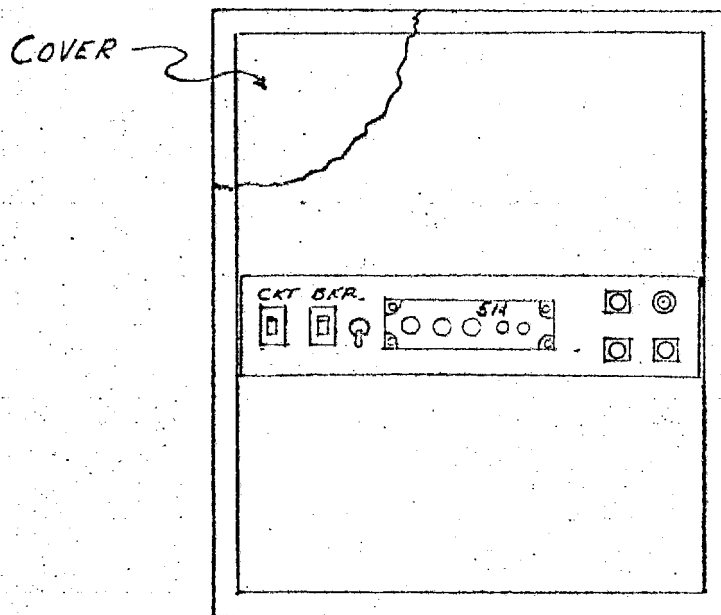
The auxiliary transit case will be constructed in the same manner as the case specified above. A removable top cover will be provided. Figure 3-12 is an illustration of typical auxiliary equipment case layout. Stowage aids and interior partitioning will be provided within the case.



A/G CABINET

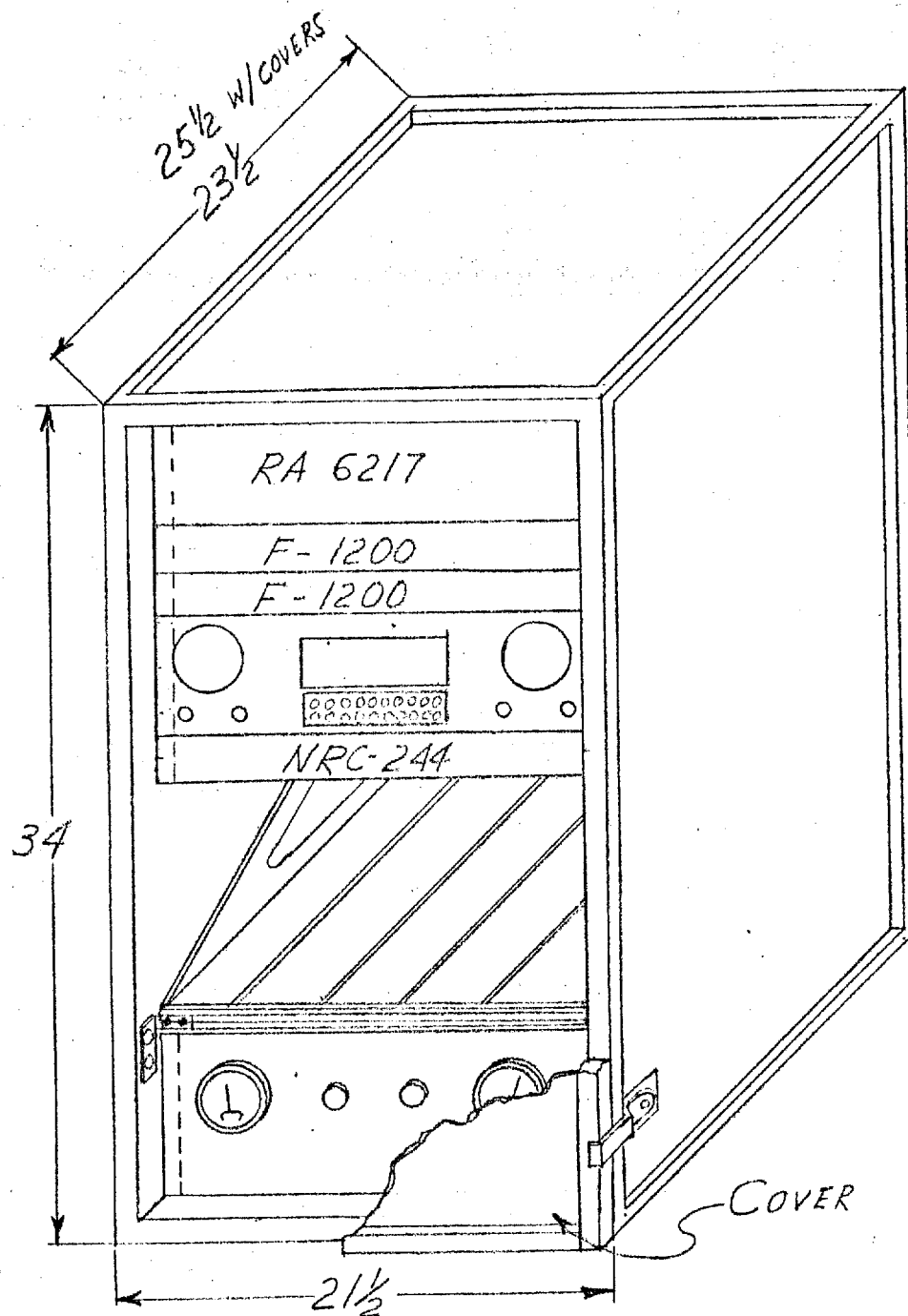


A/G CABINET RIGHT SIDE

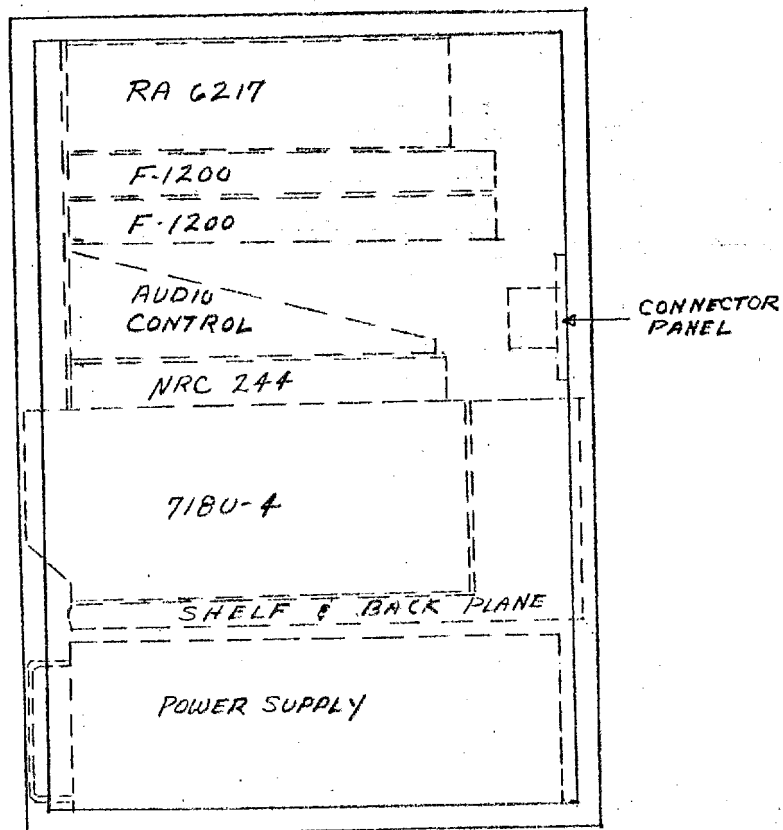


A/G CABINET REAR VIEW

FIGURE 3-8

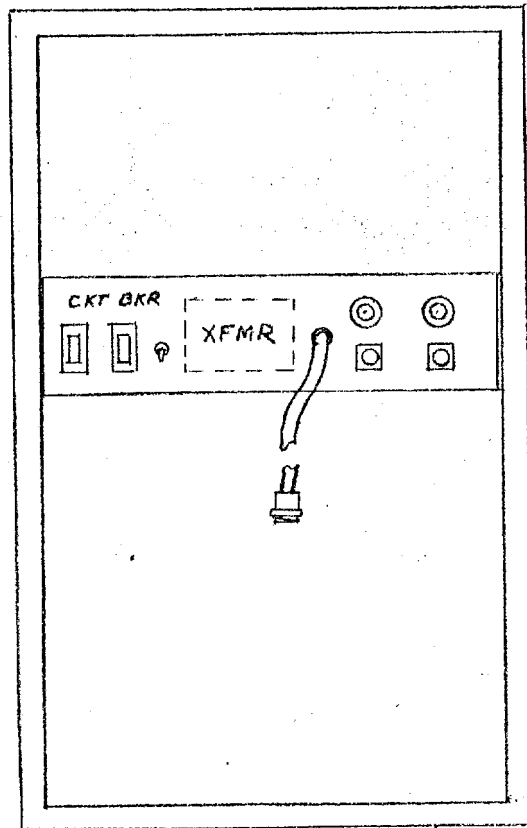


P/P CABINET



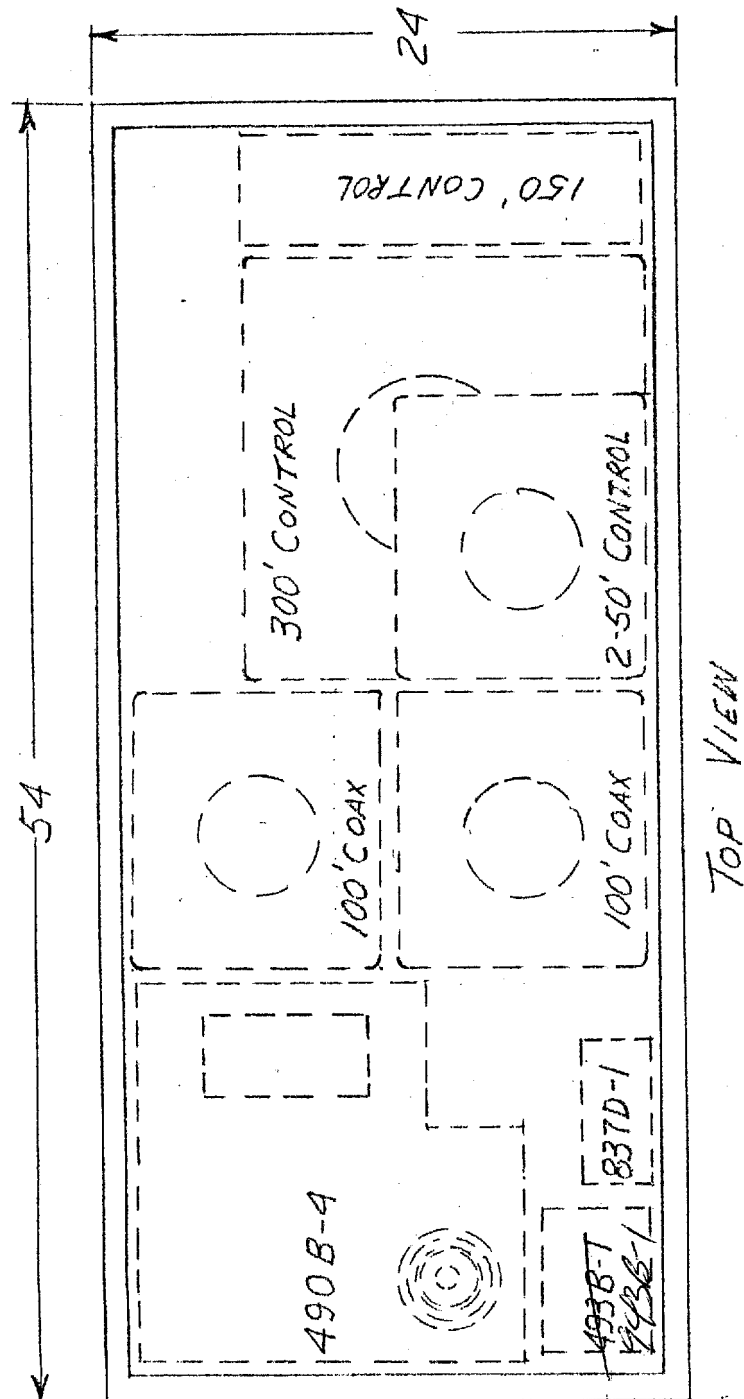
P/P RACK RIGHT SIDE

FIGURE 3-10

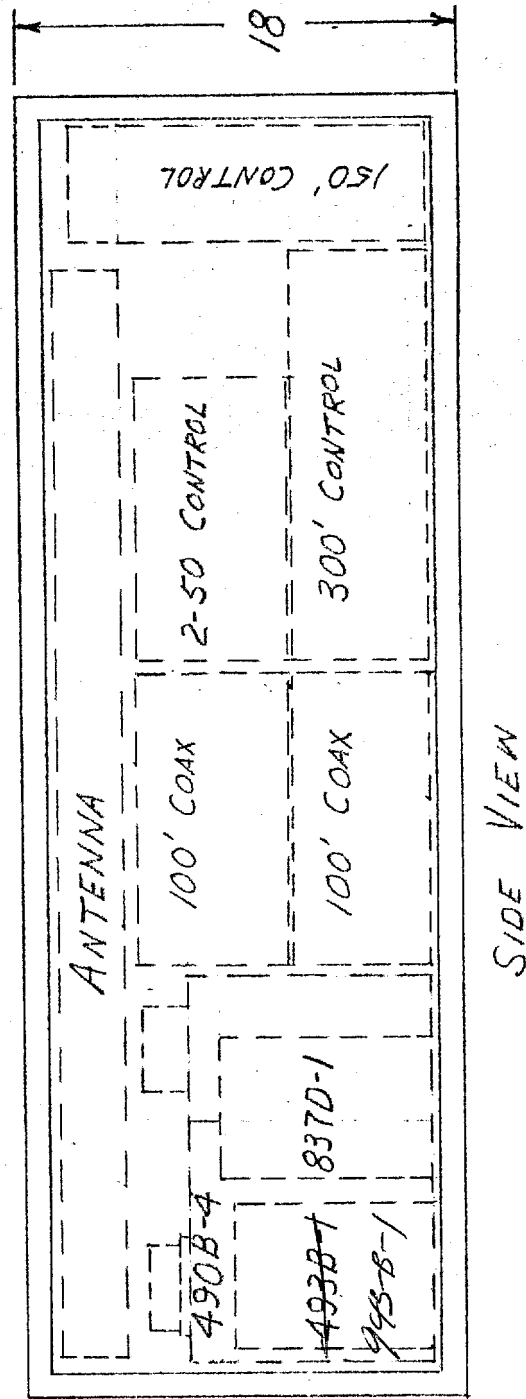


P/P RACK REAR VIEW

FIGURE 3-11



TOP VIEW



SIDE VIEW

AUXILIARY TRANSIT CASE

FIGURE 3-12

3.2.3 WEIGHT AND SIZE

Refer to Tables 3-1 and 3-2 for a tabulation of the approximate weight and size of the two terminals.

TABLE 3-1

APPROXIMATE WEIGHT AND SIZE OF A/G SYSTEM

Equipment Cabinet 290 lbs.

Includes:	1. 718U-4 HF Transceiver	38 lbs.
	2. 499R-13 Shelf	12
	3. Control Panel	7
	4. Drawer, Storage	7
	5. Remote Control Unit	12
	6. Microphone	3
	7. PRC-66A UHF Transceiver	10
	8. Power Supply	131
	9. Power Cable (50')	20
	10. Cabinet	50

Auxiliary Equipment Case 280 lbs.

Includes:	1. Case, Transit	50 lbs.
	2. 490B-4, Antenna Coupler	40
	3. Coaxial Cable (450')	72
	4. Coupler Control Cable (300')	57
	5. UHF Antenna & Case	15
	6. Antenna Base & Guys	4
	7. Cable Reels	5
	8. RCU Control Cable (50')	10
	9. Monitor Control Cable (50')	10
	10. 943B-1 UHF P. A.	8
	11. UHF Control Cable (150')	9

Total System Weight 570 lbs.

<u>Equipment Cabinet</u>	<u>Total Cubage</u>
Height 25-1/4 inches	8.0 cu. ft.
Width 21-1/2 inches	
Depth 25-1/2 inches	

Auxiliary Equipment Case

Height 18 inches	14.0 cu. ft.
Width 54 inches	
Depth 25 inches	

TABLE 3-2

APPROXIMATE WEIGHT AND SIZE OF P/P SYSTEM

Equipment Cabinet

320 lbs.

Includes:	1. RA-6217 HF Receiver (GFE)	25 lbs.
	2. 718U-4 HF Transceiver	38
	3. 499R-13 Shelf	12
	4. Audio Control Panel	20
	5. FSK Modem	21
	6. CW Key (GFE)	3
	7. Power Supply (2)	131
	8. Power Cord (50')	20
	9. Cabinet	50

Auxiliary Equipment Case

310 lbs.

Includes:	1. Case, Transit	50 lbs.
	2. 490B-4 Antenna Coupler	40
	3. Coaxial Cable (800')	128
	4. Coupler Control Cable (400')	74
	5. Cable Reels	8
	6. Antenna Base and Guys	10

Total System Weight

630 lbs.

Equipment CabinetTotal Cubage

Height 34 inches
 Width 21-1/2 inches
 Depth 25-1/2 inches

10.8 cu. ft.

Auxiliary Equipment Case

Height 18 inches
 Width 54 inches
 Depth 25 inches

14.0 cu. ft.

3.3 MAJOR EQUIPMENT LIST

3.3.1 AIR-TO-GROUND TERMINAL

The air/ground terminal consists of two transportable packages containing the following items.

<u>ITEM NO.</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
EQUIPMENT CABINET		
1.	1	671U-4A hf transceiver
2.	1	548T-1 power amplifier
3.	1	636X-2 power supply
4.	1	499R-13 equipment shelf
5.	1	DCR40-60A dc power supply
6.	1	Connector panel
7.	1	Remote Control Unit (RCU)
8.	1	AN/PRC-66A UHF transceiver
9.	1	Microphone (ptt) w/stand, cable and connector
10.	1	50 ft. length of 3 conductor power cable
11.	1	50 ft. length of grounding cable w/rod
12.	10	PJ 711 Patch cord 3 cond. 6"
13.	1	Transit Case (21-1/2 x 25-1/4 x 25-1/2 in.)
AUXILIARY EQUIPMENT CASE		
14.	1	490B-4 antenna coupler
15.	1	943B-1 power amplifier
16.	1	AS-2047/TRC 32 ft. hf whip antenna
17.	1	837D-1 uhf antenna
18.	4	100 ft. length of Superflex coax w/connectors
19.	1	50 ft. length of Superflex coax w/connectors
20.	1	300 ft. length of control/power cable w/connectors
21.	1	50 ft. length of audio/control/power cable w/connectors
22.	1	50 ft. length of audio/control cable w/connectors
23.	1	150 ft. length of control/power cable w/connectors
24.	1	Transit case (24 x 18 x 54 in.)

GFE Items - None

3.3.2 POINT-TO-POINT TERMINAL

The point-to-point terminal consists of two transportable packages containing the following items.

<u>ITEM NO.</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
EQUIPMENT CABINET		
1.	1	671U-4A hf transceiver
2.	1	548T-1 power amplifier
3.	1	636X-2 power supply
4.	1	499R-13 equipment shelf
5.	1	DCR40-60A dc power supply
6.	1	Audio control panel
7.	1	Connector Panel
8.	1	Voltage step-down transformer
9.	1	50 ft. length of 3 conductor power cable
10.	1	50 ft. length of grounding cable w/rod
11.	10	PJ711 Patch cord 3 cond. 6"
12.	1	Transit Case (21-1/2 x 34 x 25-1/2 in.)
GFE ITEMS		
13.	1	RA-6217 hf receiver
14.	2	F-1200 fsk converter
15.	1	Type 244 dual frequency shift tone keyer shelf (2 ea. 211 tone keyer)
16.	1	CW key w/cable and plug
AUXILIARY EQUIPMENT CASE		
17.	1	490B-4 antenna coupler
18.	1	AS-2047/TRC 32 ft. hf whip antenna (tx)
19.	1	AS-2046/TRC 32 ft. hf whip antenna (rcv)
20.	8	100 ft. length of Superflex coax w/connectors
21.	1	400 ft. length of control/power cable
22.	1	8 ft. tie-line cable w/connector
23.	1	Transit Case (24 x 18 x 54 in.)

4.0 EQUIPMENT SPECIFICATIONS

4.1 718U-4 HF Transceiver

The 718U-4 hf transceiver is made up of the 671U-4A transceiver, the 548T-1 power amplifier, and the 636X-2 power supply. See figure 4-1 for shelf layout.

The 718U-4 is a 400 watt pep. and average power hf transceiver which operates in the 2.0000 to 29.9999 MHz high frequency range in 100 Hz increments. The individual units are packaged in ATR cases. The 499R-13 equipment shelf provides a means of mounting the ATR cases, back plane connectors and the input/output connector for the external shelf wiring.

4.2 AN/PRC-66A UHF Transceiver

The AN/PRC-66A is a portable uhf transceiver which provides AM communication on any one of 3,500 channels in the 225.00 to 399.95 MHz ultra-high frequency range. The average power output on each channel is 2 watts. Only the transceiver portion of the AN/PRC-66A will be utilized in the A/G terminal. The battery packs, antenna, handset, carrying harness, etc. will be stored with the auxiliary equipment for emergency use.

4.3 943B-1 Power Amplifier

The 943B-1 is a broadband power amplifier capable of providing 10 watts output in the 225 to 400 MHz frequency range. The 943B-1 will produce rated output power with a minimum of 0.5 watts input power. The nominal load impedance is 50 ohms with an vswr not to exceed 3:1.

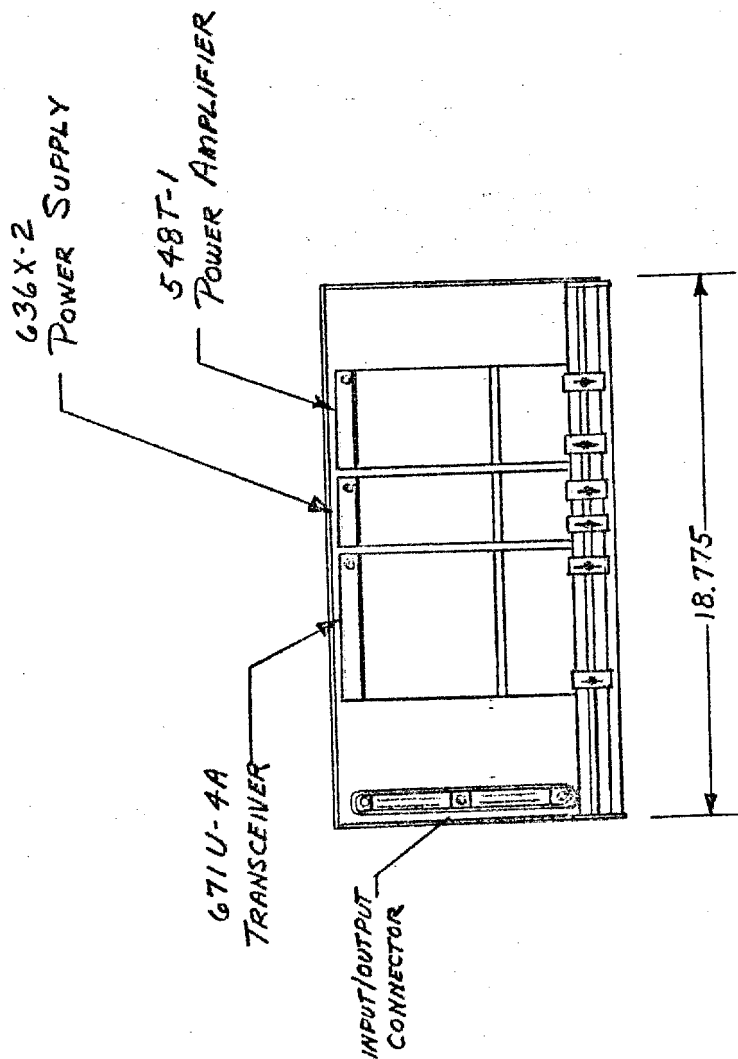


FIGURE 4-1 718U-4 HF TRANSCEIVER, SHELF

4.4 490B-4 Antenna Coupler

The 490B-4 consists of the 490T-2 automatic antenna coupler, a load coil, switching relay and cooling blower all contained in an environmentally sealed housing. The 490T-2 is an automatically tuned hf antenna coupler designed to tune wire and whip antennas in the frequency range of 2 to 30 MHz. The coupler has an input power rating of 500 watts average.

4.5 AS-2046/TRC Antenna (HF Receive)

The AS-2046 is 32 foot fiber glass whip antenna designed for receive only applications in the 2 to 30 MHz frequency range. The antenna is assembled from 4 foot sections that screw together. The kit also contains the mounting plate and guy assembly for field erection.

4.6 AS-2047/TRC Antenna (HF Transmit)

The AS-2047 is a 32 foot fiber glass whip antenna designed to mount directly to the 490B-4 antenna coupler. The antenna is assembled from 4 foot sections that screw together. The kit also contains the guy assembly for field erection.

4.7 837D-1 Antenna (UHF)

The 837D-1 is a lightweight, broadband antenna designed for operation within the 225 to 400 MHz frequency range. The antenna is a vertically polarized monopole with an input impedance of 50 ohms.

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4.8 DCR40-60A Power Supply

The DCR40-60A is a 28 volt DC power supply manufactured by Company. The DCR series provides all silicon, solid state design with voltage and current regulation. Operating at an output voltage of 28.0 volts, the supply can maintain a continuous output current of 65 amperes at an ambient temperature of +55°C.

4.9 FSJ4-50 Coaxial Cable

Type FSJ4-50 Helix Superflex coaxial cable manufactured by Andrew Corporation offers an extremely flexible cable with low attenuation characteristics. The attenuation characteristics of FSJ4-50 compared to those of RG-213 are shown in the table below for the frequency range of interest.

Attenuation Characteristics

	<u>2</u>	<u>30</u>	<u>200</u>	<u>400</u>	MHz
FSJ4-50	0.18	0.7	1.9	2.8	db/100 ft.
RG-213	0.24	1.0	2.8	4.4	db/100 ft.

Type FSJ4-50 cable has a nominal 0.5 inch outside diameter and a minimum bending radius of 1.25 inches.

5.1 TEST AND ACCEPTANCE PLAN

5.1.1 GENERAL

The equipment being offered for this project is subjected to factory tests to assure proper functioning. The equipment is then assembled and wired into their respective subsystem's positions and the overall subsystem is tested at the factory to assure overall functional compliance prior to shipment.

Notification will be made prior to the demonstration tests ~~and~~ to permit a customer representative to be present during these tests. A completed test data sheet will be signed and submitted upon completion of each system test. Discrepancies discovered during the performance tests will be corrected.

5.1.2 PERFORMANCE DEMONSTRATION TESTS

Performance demonstration tests are designed to assure the customer that the system is in good working order at the time of acceptance.

It is planned to verify the interface of the GFE AF Monitor Terminals and the A/G Terminals. Personnel familiar with the GFE units will be required to assist during the testing period.

Acceptance tests will include, but not necessarily be limited to tests of the following:

- a. Power output (each radio set)
- b. USB (hf radio set)
- c. LSB (hf radio set)
- d. CW (hf radio P/P only)
- e. Remote control operation
- f. Tuning (each radio set)
- g. Speech operation
- h. Simultaneous operation of both hf and uhf radios.

SECTION 6

IMPLEMENTATION PLAN

6.1 IMPLEMENTATION PLAN

This section describes the plan for completion of activities and deals primarily with scheduling and planning of the factory activity relative to the program. System design and equipment specifications are described in prior sections; and system documentation and test program is described in later sections.

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A logical series of steps will be accomplished to implement the program. These steps, in chronological order, are:

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- a. Specifications, work statements, and applicable documents are reviewed to determine the exact requirements. These requirements are reviewed and finalized with the customer.
- b. A Program Engineering Plan (PEP) is prepared.
- c. During preparation of the PEP, application diagrams are prepared. In final form, they represent actual system design. From these diagrams, quantities of major system components are obtained.
- d. The application diagram is used to obtain: major product line items, major government-furnished equipment items, major outside vendor equipment items. Specifications are written for vendor-supplied items and the equipment is placed on order.
- e. Detailed layout and design drawings of racks and panels are prepared along with their cable sheets and any special interface

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items or units specified and designed.

- f. After completion of the mechanical and electrical design of racks and panels, they are released to Manufacturing for build and test.
- g. Production test procedures for equipments are written by the cognizant engineers.
- h. Interrack cabling is prepared.
- i. Test engineers will test the system in accordance with previously prepared test plans. These tests will provide final acceptance of the systems to be supplied. After acceptance is obtained, instruction books are revised if required.
- j. Equipment will be packed and shipped to specified locations.

6.2 PROJECT SCHEDULE

The overall schedule for the assembly and testing of the systems is provided in figure 6-1. This schedule is based on the assumption that any equipment or package change as the result of the mockup review; late delivery of GFE items; or changes to the established design baseline herein presented will accordingly affect the scheduled completion date.

6.3 [] CUSTOMER SUPPLIED EQUIPMENTS AND INFORMATION

The successful implementation of the communication systems defined in this document depend to a great extent upon the definition of various interface areas. This paragraph and subparagraphs are concerned principally with coordination between the customer [] regarding the [] customer furnished equipments and information. Since the overall schedule is dependent upon the timely supply of such items, the required schedule for each item is included. The overall project schedule shown in figure 6-1 may be used as a reference.

PROJECT SCHEDULE

FIGURE 6-1

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1. Program Management								
2. System Engineering								
3. Draft Design Plan								
a. Prepare Design Plan			X					
b. Customer Review of Design Plan				X				
c. Customer Comments on Design Plan								
4. Final Design Plan				X				
5. Mockup								
a. Prepare Mockup					X			
b. Customer Review of Mockup								
6. P/P Terminal Assembly and Checkout								
7. A/G Terminal Assembly and Checkout								
a. Unit - 1 complete						X		
b. Unit - 2 complete							X	
8. GFE Equipment on Hand								
a. P/P Terminal Equipment					X			
b. AF Monitor Equipment							X	
9. Final Acceptance Tests								
10. Data Submittal								
a. Connector info for A.F. Monitor								
b. Connector Info for 514A-4								
c. Connector info for tie links								
d. Plug type for Audio Jackfield								
e. Recommendations on Retractable Wheels								
f. Test Procedures (info only)				X				
g. Test Report					X			

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6.3.1

[REDACTED] EQUIPMENTS AND INFORMATION

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[REDACTED] provide the following equipment and information as detailed in other paragraphs of this document.

- 1) All necessary system design.
- 2) A design plan describing the terminals provided. This design plan will be submitted as shown in the project schedule figure 6-1.
- 3) All required equipment as described in section 1, 2, and 3 of this document. Refer to major equipment lists in section 3,
- 4) Test procedure and acceptance testing as described in section 5 of this document.
- 5) System manuals as described in paragraph 8.2.1 of this document.
- 6) Major equipment as described in paragraph 8.2.2 of this document.
- 7) Investigation of equipment cabinets retractable wheel assemblies with recommendations and cost estimates provided for customer consideration.
- 8) A mockup will be prepared and available for review as shown in the project schedule, figure 6-1. The mockup will incorporate those purchased or fabricated items actually on hand at the time of demonstration.
- (9) Data will be submitted for the items shown on the project schedule figure 6-1, items 10a thru d to allow customer to integrate the terminals supplied with other equipment.

6.3.2 CUSTOMER PROVIDED EQUIPMENT AND INFORMATION

The delivery schedule shown in figure 6-1 are based on customer furnished equipment and information.

- 1) Review and approval of the draft design plan two weeks after receipt. Reference project schedule, figure 6-1.
- 2) Review and approval of the basic mockup design as indicated on the project schedule figure 6-1.
- 3) Supply GFE items for the point-to-point terminal as shown on project schedule figure 6-1 for incorporation into terminal. Mounting and wiring documentation should be provided no later than 1 August 1969.
- (4 Supply AF monitor terminal equipment as shown in project schedule figure 6-1.

SECTION 7

DOCUMENTATION

7.1 GENERAL

The proposed system documentation plan is presented in this section.

7.2 TECHNICAL PUBLICATIONS

The technical manuals supplied with the systems will be standard commercial grade publications covering the major equipment, terminal wiring and physical aspects, and system operation.

7.2.1 SYSTEM MANUAL

A brief instruction book will be provided for the point-to-point and air to ground terminals providing wiring information not presented in the major equipment manuals. Following is a brief outline of this type manual.

a. Introduction

Purpose of System

Equipment Supplied

Basic Functions Performed

b. Operation

Operating Procedures

c. Terminal Descriptions

Radios

Operator Controls

Power Distribution

Application Diagrams

d. Parts List (non-illustrated)

STAT furnish three copies of the instruction manual for each system provided.

7.2.2 MAJOR EQUIPMENT MANUALS

Commercial quality manuals will be provided for those equipments where available. Manuals to be furnished of outside vendor items will be those made available These documents will supplement the system manuals and will contain detailed information for identification, operation and maintenance of the subject unit.

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Two copies of each manual will be provided for each system where one or more of these equipments are installed.